Ileitis Control: Prophylaxis or therapy? Impact on herd performance

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Abstract

Lawsonia intracellularis (L.i.), an ubiquitous pathogen, is well known as the causative agent of ileitis, a major gut-related health disease in pork production. Two approaches exist to control the ileitis-induced loss: Therapy by antibiotics or prophylaxis by vaccination. This field study was conducted to answer the question: Does a curative treatment with antibiotics improve performance as good as protection by vaccination in a *L. intracellularis* infected herd? Production data such as average daily gain (ADG), feed conversion ratio (FCR), mortality and antibiotics usage have been collected in a 1,600 sow farrow-to-finish unit. These data have been monitored by statistical process control (SPC). It represents 16,848 animals in total, through 33 batches time-separated. Batches 1-8 were vaccinated. Batches 9 to 33 were not vaccinated. As vaccination was terminated, antibiotics were introduced to control ileitis in the finishing phase. Antibiotics consumption levels moved from 0 kg/batch (Batch 1-8) to 2.32 kg/batch (Batch 9-33). Production data showed a drop of performance: ADG dropped by -30g/day, from 811 g/day to 781 g/day, FCR increased by +0.17 kg/kg, from 2.80 kg/kg to 2.97 kg/kg. Nevertheless mortality was kept to similar level (from 3.15% to 3.47%). Gross margin calculation showed an economic difference of 3.16 €/pig in favour of the vaccinated groups. It is currently under discussion that antibiotics mask the clinical signs of ileitis and create a subclinical disease in association with further economic losses.

Introduction

Lawsonia intracellularis (L. intracellularis) is a highly prevalent pathogen present worldwide (Kim et al. 2006). McOrist et al. -1999- defined it as the causative agent of the Ileitis disease. This disease has different forms of expression ranging from an acute clinical picture with death losses to a subclinical picture which means that pigs do not show clinical signs but are affected in the performance parameters by the disease. Therapeutic treatments are able to fight the clinical effects of Ileitis. In 2000, a modified live vaccine against *L. intracellularis* -Enterisol® Ileitis- was launched which brought a new alternative in the control of the disease (Boehringer Ingelheim, 2006). Field studies reported by Hardge et al. -2004- proved the efficacy of this new tool in the control of the disease. Vaccination against Ileitis is nowadays considered as the most effective prophylactic tool to control Ileitis effects.

Under current economic pressure, pig producers constantly reconsider any financially relevant health management measure to reduce input costs of production. In the case described here the economical pressure led to the decision to step out of the Ileitis vaccination. In the retrospective the outcome of this decision was analysed in terms of impact on performance and animal health as well as on profitability.

Materials and Methods

The case took place in a 1,400-sow farrow-to-finish German farm with 5,600 nursery and 10,000 finish places. Following a 3-week rhythm, piglets were weaned at 21-day of age. They were vaccinated at weaning against *Mycoplasma hyopneumoniae*. The farm was negative towards Porcine Respiratory & Reproductive Syndrome Virus. Before study initiation PRRS eradication had been achieved following strict biosecurity measures and using mass vaccination with Ingelvac PRRS MLV® on sows and piglets during the last 8 years. No PRRS vaccine was used during the study. Since 2005, piglets were vaccinated against *L. intracellularis* using the oral vaccine Enterisol® Ileitis. The vaccine was given by drench at 14-days of age. Since December 2007, the farm manager also vaccinated against Porcine Circovirus 2 at weaning.

After weaning all pigs were transported to designated nursery units, and around 27 kg into finish units. These units were designed as all in/all out facilities. During the whole study period pigs were housed under identical conditions with ad-lib dry feed and water. The farm management summarised in one document for each batch the performance parameters routinely. It allowed monitoring for the finishing period parameters such as date in/out and numbers of pigs in/out, total weight in/out of the pigs, average daily gain (ADG), feed consumed and feed conversion ratio (FCR), mortality and amount of oral antibiotics used. The data are batch specific and were analysed using statistical process control method (SPC). Thacker (2005) described the method as being able to monitor and identify problem areas in order to optimize a process over an extended period in time.

The data described here were collected from February 2008 till January 2009. It included records of 16,848 fattening pigs in total, through 33 batches time-separated. Performance data were compared over 2 periods where the only change occurred is the redrawn of the Ileitis vaccination. Period 1 represented 8 batches before vaccination stopped (4,050 pigs; batches 1-8). Period 2 represented 25 batches where vaccination was withdrawn (12,798 pigs; batches 9-33). A gross margin (GM) was calculated based on the performance observed during the 2 periods. Weight in/out, ADG, FCR and mortality were considered. The following economic assumptions were taken: feed price 240 €/t; piglet price 45 €; pig price 1.10 €/kg slaughter weight.

Results

Production data showed a drop in performance from period 1 to period 2; ADG dropped by -30g/day, from 811 g/day to 781 g/day, FCR increased by +0.17 kg/kg, from 2.80 kg/kg to 2.97 kg/kg (figure 1). Mortality was kept to a similar level (3.15% and 3.47%). Table 1 summarises these results.

Table 1: Changes observed in data production over the 2 periods & their economical impact

	Ileitis vaccine	*No Ileitis vaccine*	*Difference*
ADG [g/day]	811	781	-30
FCR [Kg/Kg]	2.80	2.97	+0.17
Mortality (%)	3.15	3.47	+0.32
AB use [Kg/group]	0	2.32	+2.32
GM [€/pig]	-11.95	-15.11	+3.16

Figure 2 shows that antibiotics consumption levels moved from 0 kg/batch (batches 1-8) to 2.32 kg/batch (batches 9-33). As vaccination was terminated, antibiotics were introduced to control ileitis in the finishing phase. Tylosin was the only antibiotic used during the finishing phase. The average gross margin of period 1 was -11.95€/pig vs. -15.11€/pig during period 2. Period 1 demonstrated a competitive advantage of 3.16 € per pig, excluding the cost of antibiotics.

Figure 1: *Control charts of the feed conversion over the 2 periods.*

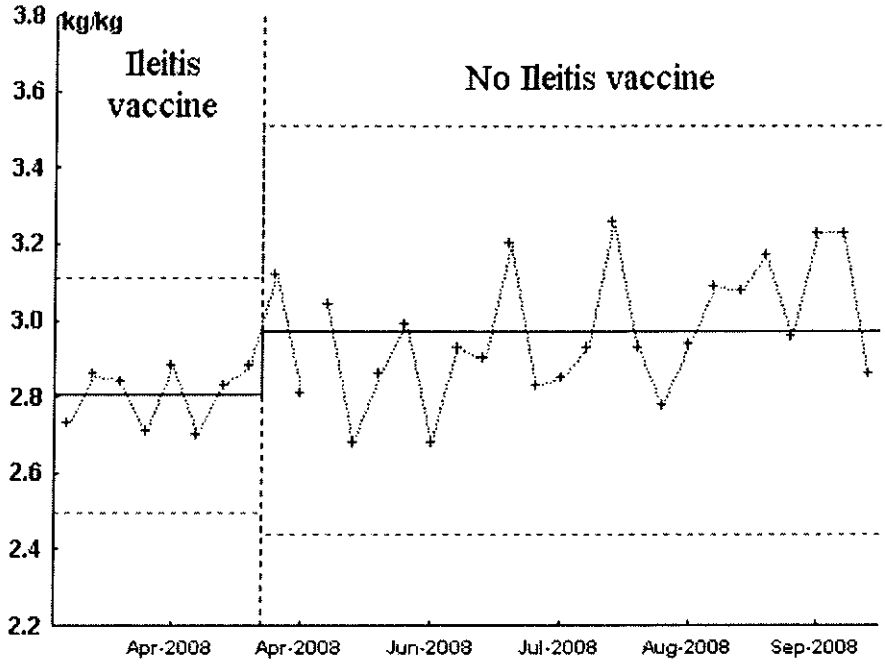
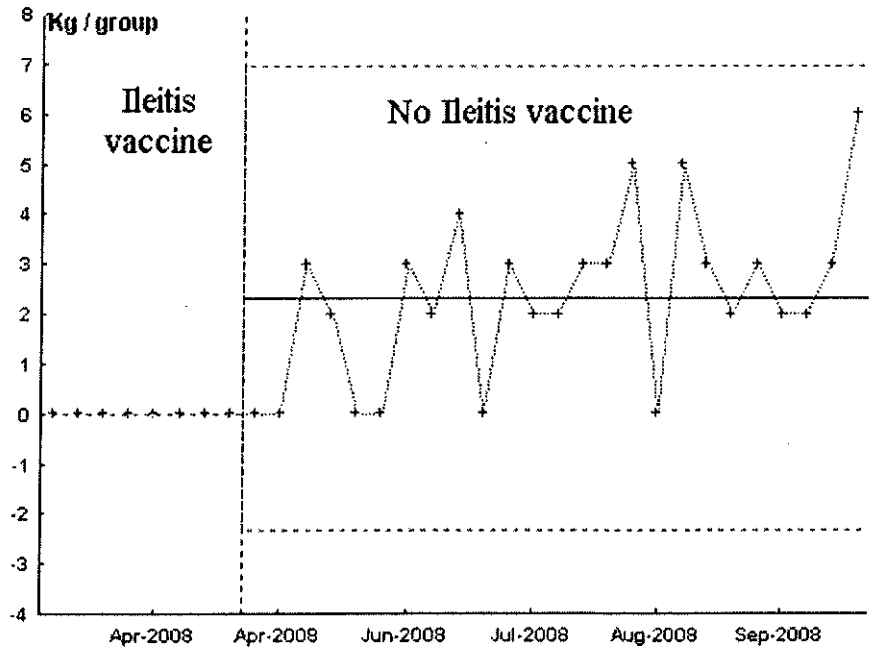


Figure 2: *Control charts of the antibiotics usage over the 2 periods.*



Discussion

This paper describes a common trend in farming where all decisions taken are under constant evaluation and changes. In a first step the farm management decided to use Enterisol® Ileitis based on the successful control of Ileitis (Steinheuer et al., 2006). Nevertheless the economic environment, the "feeling" that Ileitis was under control and the addition of a PCV2 vaccine in the health program were perceived as being enough to re-evaluate the need of an Ileitis vaccination and stop this latter one. In consequence they started to use tylosin on a regular basis in the finishing phase to treat the upcoming symptoms of Ileitis. The amount of oral antibiotics used is demonstrated in figure 2. In the same time period performances dropped slightly but consistently. This drop in performance parameters is linked to economic losses. This phenomenon was also well described by Veenhuizen et al. in 1998. He determined clinical impression scores and performance parameters of 112 pigs with clinical signs of porcine proliferative enteropathy (PPE) in a herd with history of PPE. The pigs were randomly assigned to either a control group receiving non-medicated feed (and no specific *L. intracellularis* treatment) or to a medicated group receiving feed with tylosin during 6 weeks. The medicated group presented a significantly better clinical impression score, but no difference in terms of performance. This implies that the medicated group expressed a subclinical picture of Ileitis where antibiotics reduced the clinical effect but did not prevent the disease-related damages. Also the poorer feed conversion, (which was costing 13,6kg of food between 30 and 110 kg) reinforce the hypothesis that antibiotics mask the clinical signs of ileitis and create a subclinical disease in association with lower performances.

Conclusion

This longitudinal study demonstrates the benefits of a prophylactic vaccination over a therapeutic treatment in a *L. intracellularis* infected herd. By using antibiotics the clinical form of Ileitis was treated and created a subclinical expression of the disease. But it was not possible to compensate the redrawn of Enterisol® Ileitis as far as performance parameters were concerned. Again this study shows that pig vaccines that have been developed in the past few years are effective tools to meet the requirement of a high animal welfare, performance-oriented and economically beneficial pig production alongside with reduced use of antibiotics.

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